

[illegible]

<120> GRAPEVINE LEAFROLL VIRUS PROTEINS AND THEIR USES

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<150> 60/083,404

<151> 1998-04-29

<160> 15

<170> PatentIn Ver. 2.0

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<210> 4
 <211> 360
 <212> DNA
 <213> grapevine leafroll-associated virus 3

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<400> 4
gtcagcggct cagtcagcgc gctgagaggg gatggtaaga aggtcttgat ggaggcaagg 60
acctcaactt ccgcaacttc cgacgtgtct gatttcgacg tcgtattcga agctgtttct 120
aatgcattac ttgtcgtaca ctaccaccgg gtagtgccgt atgccccgt caagcgcgag 180
cagcctaaac cggctgttaa gcaagatgag cagaagccca aacggcaagc gtcacattgg 240
gctgttaagc caacagctgt tggcgtccac gtaccacttc ctaaaaaaca ggaagcactg 300
gagccagcgc aatcagtcct acaacagtcg ttggaggaga aggccgcctt gacgtttggc 360

```

<210> 5
 <211> 120
 <212> PRT
 <213> grapevine leafroll-associated virus 3

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<400> 5
Val Ser Gly Ser Val Ser Ala Leu Arg Gly Asp Gly Lys Lys Val Leu
  1             5             10             15

Met Glu Ala Arg Thr Ser Thr Ser Ala Thr Ser Asp Val Ser Asp Phe
      20             25             30

Asp Val Val Phe Glu Ala Val Ser Asn Ala Leu Leu Val Val His Tyr

```

35 40 45

His Arg Val Val Pro Tyr Ala Pro Val Lys Arg Glu Gln Pro Lys Pro
50 55 60

Ala Val Lys Gln Asp Glu Gln Lys Pro Lys Arg Gln Ala Ser His Trp
65 70 75 80

Ala Val Lys Pro Thr Ala Val Gly Val His Val Pro Leu Pro Lys Lys
85 90 95

Gln Glu Ala Leu Glu Pro Ala Gln Ser Val Pro Gln Gln Ser Leu Glu
100 105 110

Glu Lys Ala Ala Leu Thr Phe Gly
115 120

<210> 6
<211> 816
<212> DNA
<213> grapevine leafroll-associated virus 3

<400> 6

ctgaagccgc gggaaaggga gaagctgagg gaactctttc cagagctttc gatacagttc 60
tccgactcgg tcaggagtag tcacccattc gctaatacca tgcggagctg tttcaatgga 120
atctttttcca ggaggtgtgg taatgtgtgc ttcttcgata ttggggggag cttcacgtat 180
catgtcaaag ctggccatgt gaactgtcat gtatgcaatc cagtcctaga cgttaaagat 240
gtgaagcggg gaatcaatga gatcctcttt cttccacag ctgggggaga ttcgtacgtg 300
tccagtgacc ttctaactga agcggcttca aagtctgtgt cttactgtag tcgagaatcg 360
cagaactcgc attctagagc cgatgcgggt tttatggtgg atgtgtacga tatatccccg 420
cagcaggtag cagaggctat ggataagaag ggtgcgctgg ttttcgacat agctcttatg 480
ttccccgtgg agttgttgta cggtaacggg gaagtttact tggaagaact cgatacgttg 540
gtgaagaggg aaggtgatta cctggcctac aatgttggtc agtgtggtga gatgtatgaa 600
cattccttct ctaacgtaag cgggtttttc accttttctt atgtacgcac ttcgtccggg 660
aacgtgttta agctagagta tgagggatac cgttgtggtt accatcatct cactatgtgt 720
agggctcaga agtcacctgg aactgaggtt acgtataggt cgttggtccc gtcgttcgtg 780
ggcaaatacgc tgggtttcat acctgttgta gctggt 816

<210> 7
<211> 272
<212> PRT
<213> grapevine leafroll-associated virus 3

<400> 7

Leu Lys Pro Arg Glu Arg Glu Lys Leu Arg Glu Leu Phe Pro Glu Leu
1 5 10 15

Ser Ile Gln Phe Ser Asp Ser Val Arg Ser Ser His Pro Phe Ala Asn
 20 25 30
 Ala Met Arg Ser Cys Phe Asn Gly Ile Phe Ser Arg Arg Cys Gly Asn
 35 40 45
 Val Cys Phe Phe Asp Ile Gly Gly Ser Phe Thr Tyr His Val Lys Ala
 50 55 60
 Gly His Val Asn Cys His Val Cys Asn Pro Val Leu Asp Val Lys Asp
 65 70 75 80
 Val Lys Arg Arg Ile Asn Glu Ile Leu Phe Leu Ser Thr Ala Gly Gly
 85 90 95
 Asp Ser Tyr Val Ser Ser Asp Leu Leu Thr Glu Ala Ala Ser Lys Ser
 100 105 110
 Val Ser Tyr Cys Ser Arg Glu Ser Gln Asn Cys Asp Ser Arg Ala Asp
 115 120 125
 Ala Gly Phe Met Val Asp Val Tyr Asp Ile Ser Pro Gln Gln Val Ala
 130 135 140
 Glu Ala Met Asp Lys Lys Gly Ala Leu Val Phe Asp Ile Ala Leu Met
 145 150 155 160
 Phe Pro Val Glu Leu Leu Tyr Gly Asn Gly Glu Val Tyr Leu Glu Glu
 165 170 175
 Leu Asp Thr Leu Val Lys Arg Glu Gly Asp Tyr Leu Ala Tyr Asn Val
 180 185 190
 Gly Gln Cys Gly Glu Met Tyr Glu His Ser Phe Ser Asn Val Ser Gly
 195 200 205
 Phe Phe Thr Phe Ser Tyr Val Arg Thr Ser Ser Gly Asn Val Phe Lys
 210 215 220
 Leu Glu Tyr Glu Gly Tyr Arg Cys Gly Tyr His His Leu Thr Met Cys
 225 230 235 240
 Arg Ala Gln Lys Ser Pro Gly Thr Glu Val Thr Tyr Arg Ser Leu Val
 245 250 255
 Pro Ser Phe Val Gly Lys Ser Leu Val Phe Ile Pro Val Val Ala Gly
 260 265 270

<210> 8
 <211> 873
 <212> DNA
 <213> grapevine leafroll-associated virus 3

<400> 8
 gtgggcgaat cgtttaagtc cttogaatat aagtgtctata atgctcccc aggtggcggt 60
 aagacgacga cgtagtgga cgaattcggt aagtcaccca atagcacagc caccattacg 120
 gctaattgtg gaagttctga ggacataaat atggcggtga agaagagaga tccgaatttg 180
 gaaggtctca acagtgtac cacagttaac tccagggtgg taaactttat cgtcagggga 240
 atgtataaaa gggttttggt ggatgaggtg cacatgatgc atcaaggctt actacaacta 300
 ggcgtcttcg caaccggcgc gtcggaaggc ctcttttttg gagacataaa tcagatacca 360
 ttcataaaca gggagaaggt gtttaggatg gattgtgctg tttttgttcc aaagaaggaa 420
 agcgttgtag acacttctaa atcgtacagg tgtccgttag atgtttgcta cttgttgctc 480
 tcaatgaccg taaggggaac ggaaaagtgt taccctgaaa aggtcgttag cggttaaggac 540
 aaaccagtag taagatcgct gtccaaaagg ccaattggaa ccaactgatg cgtagctgaa 600
 ataaacgctg acgtgtactt gtgcatgacc cagttggaga agtcggatat gaagaggctg 660
 ttgaaggga aaggaaaaga aacaccagtg atgacagtgc atgaagcaca gggaaaaaca 720
 ttcagtgatg tggattgtt taggacgaag aaagccgatg actccctatt cactaaacaa 780
 ccgcataatac ttgttggttt gtcgagacac acacgctcac tggtttatgc cgctctgagc 840
 tcaaagttag acgataaggt cggcacatat att 873

<210> 9
 <211> 291
 <212> PRT
 <213> grapevine leafroll-associated virus 3

<400> 9
 Val Gly Glu Ser Phe Lys Ser Phe Glu Tyr Lys Cys Tyr Asn Ala Pro
 1 5 10 15
 Pro Gly Gly Gly Lys Thr Thr Thr Leu Val Asp Glu Phe Val Lys Ser
 20 25 30
 Pro Asn Ser Thr Ala Thr Ile Thr Ala Asn Val Gly Ser Ser Glu Asp
 35 40 45
 Ile Asn Met Ala Val Lys Lys Arg Asp Pro Asn Leu Glu Gly Leu Asn
 50 55 60
 Ser Ala Thr Thr Val Asn Ser Arg Val Val Asn Phe Ile Val Arg Gly
 65 70 75 80
 Met Tyr Lys Arg Val Leu Val Asp Glu Val His Met Met His Gln Gly

85

90

95

Leu Leu Gln Leu Gly Val Phe Ala Thr Gly Ala Ser Glu Gly Leu Phe
100 105 110

Phe Gly Asp Ile Asn Gln Ile Pro Phe Ile Asn Arg Glu Lys Val Phe
115 120 125

Arg Met Asp Cys Ala Val Phe Val Pro Lys Lys Glu Ser Val Val Tyr
130 135 140

Thr Ser Lys Ser Tyr Arg Cys Pro Leu Asp Val Cys Tyr Leu Leu Ser
145 150 155 160

Ser Met Thr Val Arg Gly Thr Glu Lys Cys Tyr Pro Glu Lys Val Val
165 170 175

Ser Gly Lys Asp Lys Pro Val Val Arg Ser Leu Ser Lys Arg Pro Ile
180 185 190

Gly Thr Thr Asp Asp Val Ala Glu Ile Asn Ala Asp Val Tyr Leu Cys
195 200 205

Met Thr Gln Leu Glu Lys Ser Asp Met Lys Arg Ser Leu Lys Gly Lys
210 215 220

Gly Lys Glu Thr Pro Val Met Thr Val His Glu Ala Gln Gly Lys Thr
225 230 235 240

Phe Ser Asp Val Val Leu Phe Arg Thr Lys Lys Ala Asp Asp Ser Leu
245 250 255

Phe Thr Lys Gln Pro His Ile Leu Val Gly Leu Ser Arg His Thr Arg
260 265 270

Ser Leu Val Tyr Ala Ala Leu Ser Ser Lys Leu Asp Asp Lys Val Gly
275 280 285

Thr Tyr Ile
290

<210> 10

<211> 1599

<212> DNA

<213> grapevine leafroll-associated virus 3

<400> 10

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atgaattttg gaccgacctt cgaaggggag ttggtacgga agataccaac aagtcatttt 60
gtagccgtga atgggtttct cgaggactta ctgcacggtt gtccggcttt cgactatgac 120
ttctttgagg atgatttcga aacttcagat cagtctttcc tcatagaaga tgtgcgcat 180
tctgaatctt tttctcattt tacgtcgaaa atagaggata ggttttacag ttttattagg 240
tctagcgtag gtttaccaaa gcgcaacacc ttgaagtgtg acctcgtcac gtttgaaaat 300
aggaatttca acgccgatcg cggttgtaac gtgggttggt acgactctgt ggcgcatgaa 360
ctgaaggaga ttttcttcga ggaggctggt aacaaagctc gtttagcaga ggtgacggaa 420
agccatttgt ccagcaacac gatgttggtt tcagattggt tggacaaaag ggcacctaac 480
gcttacaagt ctctcaagcg ggcttttagt tcgtttgtct ttcacccgtc tatgttgact 540
tcttatacgc tcatggtgaa agcagacgta aaaccaagt tggacaatac gccattgtcg 600
aagtacgtaa cggggcgaaa tatagtctac cacgataggt gcgtaactgc gcttttttct 660
tgcatTTTTT ctgctgctg agagcgctta aaatacgtag tggacgaaag gtggctcttc 720
taccacggga tggacactgc ggagttggcg gctgcattga ggaacaattt gggggacatc 780
cggcaatact acacctatga actggatatc agtaagtacg acaaactctc gagtgctctc 840
atgaagcagg tggaggagtt gatactcttg acacttggtg ttgatagaga agttttgtct 900
actttctttt gtggtgagta tgatagcgtc gtgagaacga tgacgaagga attggtgttg 960
tctgtcggct ctgagaggcg cagtgggtgt gctaacacgt ggttgggaaa tagtttagtc 1020
ttgtgcacct tgtgtccgt agtacttagg ggattagatt atagttatat tgtagttagc 1080
ggtgatgata gccttatatt tagtcggcag ccgttggata ttgatacgtc ggttctgagc 1140
gataattttg gttttgacgt aaagattttt aaccaagctg ctccatattt ttgttctaag 1200
tttttagttc aagtcgagga tagtctcttt tttgttcccg atccacttaa actcttcgtt 1260
aagtttgag cttccaaaac ttcagatata gaccttttac atgagatttt tcaatctttc 1320
gtcgatcttt cgaagggttt caatagagag gacgtcatcc aggaattagc taagctggtg 1380
acgcggaaat ataagcattc gggatggacc tactcggctt tgtgtgtctt gcacgtttta 1440
agtgc aaatt tttcgcagtt ctgtagggtt tattaccaca atagcgtgaa tctcgatgtg 1500
cgccctattc agaggaccga gtcgctttcc ttgctggcct tgaaggcaag aattttaagg 1560
tggaagcctt ctggttttgc cttttcgata aagaggggt 1599

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<210> 11

<211> 533

<212> PRT

<213> grapevine leafroll-associated virus 3

<400> 11

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Met Asn Phe Gly Pro Thr Phe Glu Gly Glu Leu Val Arg Lys Ile Pro
  1                   5                   10                   15

```

```

Thr Ser His Phe Val Ala Val Asn Gly Phe Leu Glu Asp Leu Leu Asp
      20                   25                   30

```

```

Gly Cys Pro Ala Phe Asp Tyr Asp Phe Phe Glu Asp Asp Phe Glu Thr
      35                   40                   45

```

```

Ser Asp Gln Ser Phe Leu Ile Glu Asp Val Arg Ile Ser Glu Ser Phe
      50                   55                   60

```

```

Ser His Phe Thr Ser Lys Ile Glu Asp Arg Phe Tyr Ser Phe Ile Arg
      65                   70                   75                   80

```

Ser	Ser	Val	Gly	Leu	Pro	Lys	Arg	Asn	Thr	Leu	Lys	Cys	Asn	Leu	Val	
				85					90					95		
Thr	Phe	Glu	Asn	Arg	Asn	Phe	Asn	Ala	Asp	Arg	Gly	Cys	Asn	Val	Gly	
				100					105					110		
Cys	Asp	Asp	Ser	Val	Ala	His	Glu	Leu	Lys	Glu	Ile	Phe	Phe	Glu	Glu	
				115					120					125		
Val	Val	Asn	Lys	Ala	Arg	Leu	Ala	Glu	Val	Thr	Glu	Ser	His	Leu	Ser	
				130					135					140		
Ser	Asn	Thr	Met	Leu	Leu	Ser	Asp	Trp	Leu	Asp	Lys	Arg	Ala	Pro	Asn	
				145					150					155		
Ala	Tyr	Lys	Ser	Leu	Lys	Arg	Ala	Leu	Gly	Ser	Phe	Val	Phe	His	Pro	
				165					170					175		
Ser	Met	Leu	Thr	Ser	Tyr	Thr	Leu	Met	Val	Lys	Ala	Asp	Val	Lys	Pro	
				180					185					190		
Lys	Leu	Asp	Asn	Thr	Pro	Leu	Ser	Lys	Tyr	Val	Thr	Gly	Gln	Asn	Ile	
				195					200					205		
Val	Tyr	His	Asp	Arg	Cys	Val	Thr	Ala	Leu	Phe	Ser	Cys	Ile	Phe	Thr	
				210					215					220		
Ala	Cys	Val	Glu	Arg	Leu	Lys	Tyr	Val	Val	Asp	Glu	Arg	Trp	Leu	Phe	
				225					230					235		
Tyr	His	Gly	Met	Asp	Thr	Ala	Glu	Leu	Ala	Ala	Ala	Leu	Arg	Asn	Asn	
				245					250					255		
Leu	Gly	Asp	Ile	Arg	Gln	Tyr	Tyr	Thr	Tyr	Glu	Leu	Asp	Ile	Ser	Lys	
				260					265					270		
Tyr	Asp	Lys	Ser	Gln	Ser	Ala	Leu	Met	Lys	Gln	Val	Glu	Glu	Leu	Ile	
				275					280					285		
Leu	Leu	Thr	Leu	Gly	Val	Asp	Arg	Glu	Val	Leu	Ser	Thr	Phe	Phe	Cys	
				290					295					300		
Gly	Glu	Tyr	Asp	Ser	Val	Val	Arg	Thr	Met	Thr	Lys	Glu	Leu	Val	Leu	
				305					310					315		
Ser	Val	Gly	Ser	Gln	Arg	Arg	Ser	Gly	Gly	Ala	Asn	Thr	Trp	Leu	Gly	
				325					330					335		

Asn Ser Leu Val Leu Cys Thr Leu Leu Ser Val Val Leu Arg Gly Leu
 340 345 350

Asp Tyr Ser Tyr Ile Val Val Ser Gly Asp Asp Ser Leu Ile Phe Ser
 355 360 365

Arg Gln Pro Leu Asp Ile Asp Thr Ser Val Leu Ser Asp Asn Phe Gly
 370 375 380

Phe Asp Val Lys Ile Phe Asn Gln Ala Ala Pro Tyr Phe Cys Ser Lys
 385 390 395 400

Phe Leu Val Gln Val Glu Asp Ser Leu Phe Phe Val Pro Asp Pro Leu
 405 410 415

Lys Leu Phe Val Lys Phe Gly Ala Ser Lys Thr Ser Asp Ile Asp Leu
 420 425 430

Leu His Glu Ile Phe Gln Ser Phe Val Asp Leu Ser Lys Gly Phe Asn
 435 440 445

Arg Glu Asp Val Ile Gln Glu Leu Ala Lys Leu Val Thr Arg Lys Tyr
 450 455 460

Lys His Ser Gly Trp Thr Tyr Ser Ala Leu Cys Val Leu His Val Leu
 465 470 475 480

Ser Ala Asn Phe Ser Gln Phe Cys Arg Leu Tyr Tyr His Asn Ser Val
 485 490 495

Asn Leu Asp Val Arg Pro Ile Gln Arg Thr Glu Ser Leu Ser Leu Leu
 500 505 510

Ala Leu Lys Ala Arg Ile Leu Arg Trp Lys Ala Ser Arg Phe Ala Phe
 515 520 525

Ser Ile Lys Arg Gly
 530

<210> 12

<211> 111

<212> DNA

<213> grapevine leafroll-associated virus 3

<400> 12

atgttatgtt gttcagccag tgtcaaattt tcaaacgggt tacaattatc gctacttatt 60

tgcgcatggt tgtagcgggt gctaattggt agcttttgta gaaggcgatg a 111

<210> 13

<211> 36

<212> PRT

<213> grapevine leafroll-associated virus 3

<400> 13

Met Leu Cys Cys Ser Ala Ser Val Lys Phe Ser Asn Gly Leu Gln Leu
1 5 10 15

Ser Leu Leu Ile Cys Ala Cys Leu Leu Ala Val Leu Ile Val Ser Phe
20 25 30

Cys Arg Arg Arg
35

<210> 14

<211> 279

<212> DNA

<213> grapevine leafroll-associated virus 3

<400> 14

aaaaatcctt caataaatTTT gaaataaaca aaagtaagaa aaatgaaata attaggctag 60
tctttttggt cgtctttcgc tttttagtaa taggttttat ttcgaggtaa gatgactaaa 120
ctttacctca cggtttaata ctctgatatt tgtaaaatta gtccgtaaag tcgatagtga 180
tattatatta gtatagtata ataaacgcca aaatccaatt aaagtttggg acctaggcgg 240
gcctcttacg aggctaactt atcgacaata agtttaggtc 279

<210> 15

<211> 2237

<212> PRT

<213> grapevine leafroll-associated virus 3

<400> 15

Met Asp Tyr Ile Arg Pro Leu Arg Val Phe Ser Phe Pro His Val Asn
1 5 10 15

Asn Thr Leu Glu Tyr Val Arg Tyr Asn Lys Ala Asn Gly Asp Val Gly
20 25 30

Ala Phe Leu Thr Thr Met Lys Phe Ile Gly Asn Val Lys Leu Ser Asp
35 40 45

Phe Thr Pro Arg Cys Ala Ala Met Ile Tyr Ile Gly Lys Leu Thr Lys
50 55 60

Gly Val Lys Arg Thr Phe Val Pro Pro Pro Val Lys Gly Phe Ala Arg
 65 70 75 80
 Gln Tyr Ala Val Val Ser Gly Ser Val Ser Ala Leu Arg Gly Asp Gly
 85 90 95
 Lys Lys Val Leu Met Glu Ala Arg Thr Ser Thr Ser Ala Thr Ser Asp
 100 105 110
 Val Ser Asp Phe Asp Val Val Phe Glu Ala Val Ser Asn Ala Leu Leu
 115 120 125
 Val Val His Tyr His Arg Val Val Pro Tyr Ala Pro Val Lys Arg Glu
 130 135 140
 Gln Pro Lys Pro Ala Val Lys Gln Asp Glu Gln Lys Pro Lys Arg Gln
 145 150 155 160
 Ala Ser His Trp Ala Val Lys Pro Thr Ala Val Gly Val His Val Pro
 165 170 175
 Leu Pro Lys Lys Gln Glu Ala Leu Glu Pro Ala Gln Ser Val Pro Gln
 180 185 190
 Gln Ser Leu Glu Glu Lys Ala Ala Leu Thr Phe Gly Leu Phe Phe Ser
 195 200 205
 Lys Gly Gly Gly Asp Glu Ser Asp Ala Val Ile Leu Arg Lys Gly Lys
 210 215 220
 Leu Phe Asn Arg Ala Leu Asn Val Pro Ile Asp Val Lys Asn Thr Phe
 225 230 235 240
 Val Trp Ala Lys Ile Trp Asp Glu Ala Ser Arg Arg Arg Gly Tyr Phe
 245 250 255
 Tyr Val Lys Asp Arg Ala Val Lys Phe Phe Pro Ile Val Arg Gly Arg
 260 265 270
 Ala Thr Ile Glu Asp Phe Ile Val Asn Thr Ala Pro Gly Cys Asp Val
 275 280 285
 Ala Leu Pro Arg Ile Glu Leu Trp Ser Met Arg Glu Arg Ala Phe Val
 290 295 300
 Cys Thr Thr Lys Gly Trp Cys Trp Phe Asn Asn Glu Arg Leu Arg Gly
 305 310 315 320

Arg	Glu	Ser	Gln	Asn	Cys	Asp	Ser	Arg	Ala	Asp	Ala	Gly	Phe	Met	Val	580	585	590
Asp	Val	Tyr	Asp	Ile	Ser	Pro	Gln	Gln	Val	Ala	Glu	Ala	Met	Asp	Lys	595	600	605
Lys	Gly	Ala	Leu	Val	Phe	Asp	Ile	Ala	Leu	Met	Phe	Pro	Val	Glu	Leu	610	615	620
Leu	Tyr	Gly	Asn	Gly	Glu	Val	Tyr	Leu	Glu	Glu	Leu	Asp	Thr	Leu	Val	625	630	635
Lys	Arg	Glu	Gly	Asp	Tyr	Leu	Ala	Tyr	Asn	Val	Gly	Gln	Cys	Gly	Glu	645	650	655
Met	Tyr	Glu	His	Ser	Phe	Ser	Asn	Val	Ser	Gly	Phe	Phe	Thr	Phe	Ser	660	665	670
Tyr	Val	Arg	Thr	Ser	Ser	Gly	Asn	Val	Phe	Lys	Leu	Glu	Tyr	Glu	Gly	675	680	685
Tyr	Arg	Cys	Gly	Tyr	His	His	Leu	Thr	Met	Cys	Arg	Ala	Gln	Lys	Ser	690	695	700
Pro	Gly	Thr	Glu	Val	Thr	Tyr	Arg	Ser	Leu	Val	Pro	Ser	Phe	Val	Gly	705	710	715
Lys	Ser	Leu	Val	Phe	Ile	Pro	Val	Val	Ala	Gly	Ser	Ser	Val	Ser	Phe	725	730	735
Lys	Thr	Ile	Val	Leu	Asp	Ser	Asp	Phe	Val	Asp	Arg	Ile	Tyr	Ser	Tyr	740	745	750
Ala	Leu	Asn	Thr	Ile	Gly	Thr	Phe	Glu	Asn	Arg	Thr	Phe	Glu	Tyr	Ala	755	760	765
Val	Gly	Ala	Val	Arg	Ser	Gln	Lys	Thr	His	Val	Ile	Thr	Gly	Ser	Arg	770	775	780
Val	Val	His	Ser	Lys	Val	Asp	Ile	Ser	Pro	Asp	Asp	Met	Trp	Gly	Leu	785	790	795
Val	Val	Ala	Val	Met	Ala	Gln	Ala	Ile	Lys	Asp	Arg	Ala	Lys	Ser	Ile	805	810	815
Arg	Ser	Tyr	Asn	Phe	Ile	Lys	Ala	Ser	Glu	Gly	Ser	Leu	Ala	Gly	Val	820	825	830

Phe	Lys	Leu	Phe	Phe	Gln	Thr	Val	Gly	Asp	Cys	Phe	Ser	Asn	Ala	Val
835						840						845			
Ser	Val	Tyr	Ala	Lys	Ala	Met	Val	His	Asp	Asn	Phe	Asn	Val	Leu	Glu
850						855				860					
Thr	Leu	Met	Ser	Met	Pro	Arg	Ala	Phe	Ile	Arg	Lys	Val	Pro	Gly	Ser
865				870						875				880	
Val	Val	Val	Thr	Ile	Cys	Thr	Ser	Gly	Ala	Ser	Asp	Arg	Leu	Glu	Leu
				885				890						895	
Arg	Gly	Ala	Phe	Asp	Ile	Ser	Lys	Glu	Thr	Phe	Gly	Arg	Lys	Leu	Lys
		900						905				910			
Asn	Ser	Arg	Leu	Arg	Val	Phe	Ser	Arg	Ala	Ile	Val	Glu	Asp	Ser	Ile
915						920						925			
Lys	Val	Met	Lys	Ala	Met	Lys	Thr	Glu	Asp	Gly	Lys	Pro	Leu	Pro	Ile
930						935				940					
Thr	Glu	Asp	Ser	Val	Tyr	Ala	Phe	Ile	Met	Gly	Asn	Val	Ser	Asn	Val
945				950						955				960	
His	Cys	Thr	Arg	Ala	Gly	Leu	Leu	Gly	Gly	Ser	Lys	Ala	Thr	Val	Val
				965				970						975	
Ser	Ser	Val	Ser	Lys	Gly	Leu	Val	Ala	Arg	Gly	Ala	Ala	Thr	Lys	Ala
		980						985				990			
Phe	Ser	Gly	Ile	Thr	Ser	Phe	Phe	Ser	Thr	Gly	Ser	Leu	Phe	Tyr	Asp
995						1000						1005			
Arg	Gly	Leu	Thr	Glu	Asp	Glu	Arg	Leu	Asp	Ala	Leu	Val	Arg	Thr	Glu
1010						1015				1020					
Asn	Ala	Ile	Asn	Ser	Pro	Val	Gly	Ile	Leu	Glu	Thr	Ser	Arg	Val	Ala
1025				1030						1035				1040	
Val	Ser	Lys	Val	Val	Ala	Gly	Thr	Lys	Glu	Phe	Trp	Ser	Glu	Val	Ser
		1045						1050				1055			
Leu	Asn	Asp	Phe	Thr	Thr	Phe	Val	Leu	Arg	Asn	Lys	Val	Leu	Ile	Gly
		1060						1065				1070			
Ile	Phe	Val	Ala	Ser	Leu	Gly	Ala	Ala	Pro	Ile	Ala	Trp	Lys	Tyr	Arg
1075						1080						1085			

Ala Val Ala Glu Arg Gln Gly Asp Pro Ser Gly Ser Gly Thr Ala Asp			
1345	1350	1355	1360
Ala Met Ala Phe Val Glu Ser Val Lys Lys Gly Val Asp Asp Val Phe			
	1365	1370	1375
His Gln Gln Ser Ser Gly Glu Thr Ala Arg Glu Val Glu Val Asp Gly			
	1380	1385	1390
Lys Gly Leu Leu Pro Glu Ser Val Val Gly Glu Ala Pro Thr Gln Glu			
	1395	1400	1405
Arg Gly Arg Ala Ala Asp Gly Asn Thr Ala Gln Thr Ala Val Asn Glu			
	1410	1415	1420
Gly Asp Arg Glu Pro Val Gln Ser Ser Leu Val Ser Ser Pro Gln Ala			
1425	1430	1435	1440
Asp Ile Pro Lys Val Thr Gln Ser Glu Val His Ala Gln Lys Glu Val			
	1445	1450	1455
Lys Gln Glu Val Pro Leu Ala Thr Val Ser Gly Ala Thr Pro Ile Val			
	1460	1465	1470
Asp Glu Lys Pro Ala Pro Ser Val Thr Thr Arg Gly Val Lys Ile Ile			
	1475	1480	1485
Asp Lys Gly Lys Ala Val Ala His Val Ala Glu Lys Lys Gln Val Gln			
	1490	1495	1500
Val Glu Gln Pro Lys Gln Arg Ser Leu Thr Ile Asn Glu Gly Lys Ala			
1505	1510	1515	1520
Gly Lys Gln Leu Cys Met Phe Arg Thr Cys Ser Cys Gly Val Gln Leu			
	1525	1530	1535
Asp Val Tyr Asn Glu Ala Thr Ile Ala Thr Arg Phe Ser Asn Ala Phe			
	1540	1545	1550
Thr Phe Val Asp Asn Leu Lys Gly Arg Ser Ala Val Phe Phe Ser Lys			
	1555	1560	1565
Leu Gly Glu Gly Tyr Thr Tyr Asn Gly Gly Ser His Val Ser Ser Gly			
	1570	1575	1580
Trp Pro Arg Ala Leu Glu Asp Ile Leu Thr Ala Ile Lys Tyr Pro Ser			
1585	1590	1595	1600

Val Phe Asp His Cys Leu Val Gln Lys Tyr Lys Met Gly Gly Gly Val
 1605 1610 1615
 Pro Phe His Ala Asp Asp Glu Glu Cys Tyr Pro Ser Asp Asn Pro Ile
 1620 1625 1630
 Leu Thr Val Asn Leu Val Gly Lys Ala Asn Phe Ser Thr Lys Cys Arg
 1635 1640 1645
 Lys Gly Gly Lys Val Met Val Ile Asn Val Ala Ser Gly Asp Tyr Phe
 1650 1655 1660
 Leu Met Pro Cys Gly Phe Gln Arg Thr His Leu His Ser Val Asn Ser
 1665 1670 1675 1680
 Ile Asp Glu Gly Arg Ile Ser Leu Thr Phe Arg Ala Thr Arg Arg Val
 1685 1690 1695
 Phe Gly Val Gly Arg Met Leu Gln Leu Ala Gly Gly Val Ser Asp Glu
 1700 1705 1710
 Lys Ser Pro Gly Val Pro Asn Gln Gln Pro Gln Ser Gln Gly Ala Thr
 1715 1720 1725
 Arg Thr Ile Thr Pro Lys Ser Gly Gly Lys Ala Leu Ser Glu Gly Ser
 1730 1735 1740
 Gly Arg Glu Val Lys Gly Arg Ser Thr Tyr Ser Ile Trp Cys Glu Gln
 1745 1750 1755 1760
 Asp Tyr Val Arg Lys Cys Glu Trp Leu Arg Ala Asp Asn Pro Val Met
 1765 1770 1775
 Ala Leu Glu Pro Asp Tyr Thr Pro Met Thr Phe Glu Val Val Lys Thr
 1780 1785 1790
 Gly Thr Ser Glu Asp Ala Val Val Glu Tyr Leu Lys Tyr Leu Ala Ile
 1795 1800 1805
 Gly Ile Glu Arg Thr Tyr Arg Ala Leu Leu Met Ala Arg Asn Ile Ala
 1810 1815 1820
 Val Thr Thr Ala Glu Gly Val Leu Lys Val Pro Asn Gln Val Tyr Glu
 1825 1830 1835 1840
 Ser Leu Pro Gly Phe His Val Tyr Lys Ser Gly Thr Asp Leu Ile Phe
 1845 1850 1855

